of earnings. At the very lowest estimate, $3 of capital must be invested for every $1 earned. Under the present bond limit, therefore, the city's ability to purchase or build is becoming more and more inadequate, thus requiring a progressive refunding basis.

The present available purchasing power of the city is approximately $51,000,000 for all purposes, including water supply. By 1930 the total railway investment required will be $62,000,000; by 1950, $123,000,000. This means that over one-third of the total bonding capacity of the city on its present 15% basis would be continually preempted for railway investment alone, assuming the city entirely free from debt.

If the city of San Francisco declines to accept the assistance of private capital in financing its utilities both for the present and the future, the conclusion cannot be evaded that a revision of the bond limit must be secured immediately in order to provide the capital necessary for preserving the normal rate of growth of the city as herein predicted.

ADVANTAGES OF OIL FUEL.

Admiral H. I. Cone, United States Navy, in a statement regarding the relative values of oil and coal for steam-raising in the navy, makes clear the following points:—

The advantages of oil as compared with coal are:—

An evaporation per pound of fuel in the ratio of about 14 to 9 (15.5 to 10) and per square foot of heating surface in about the ratio of 10 to 8 (12.5 to 10).

Fuel can be taken aboard more rapidly without manual labor and without interruption to the routine of the ship. The problem of fueling at sea is solved.

Steam for full power can be maintained as readily as for low power. A vessel burning oil is capable of runs at full speed, limited in duration only by the supply of fuel. There is no reduction in speed due to dirty fires or to difficulty in trimming coal from remote bunkers or to exhaustion of the fireroom force.

There are no cinders and the amount of smoke can be controlled.

A considerable reduction in personnel is possible.

The weight and space required for boilers are reduced, first, by the reduction in heating surface required; and, second, by the shortening of firerooms. Consequent on the reduction in heating surface is a decrease in weight and cost of boilers.

Coal and ash-handling gear is eliminated. This renders unnecessary the piercing of the hull for coal trunks and dischargers from the ash-expellers or ash-ejectors.

The stowage and handling of oil are much easier than of coal, and will result in a much cleaner ship, with consequent increase in time available for drills.

The mechanical supply of fuel to the boilers gives a prompt and delicate control of the steam supply, permitting more sudden changes in speed than with coal, which is a tactical advantage.

The nature of fuel oil permits utilization of remote portions of the ship and of constructed spaces for its stowage.

These advantages have long been recognized by the navy, and there have been experiments with liquid fuel dating back as far as 1867. All these experiments have confirmed our belief in the considerable military advantages which will accrue from its use, but until recently it has been impracticable to use it extensively on account of the uncertainty as to the adequacy of its supply and the sufficiency of its distribution among the seaports of the world.

AN EFFICIENT METHOD OF ROAD-OILING.

To spread oil on roads for a distance of twenty miles or more from the starting point, and to spread it at a heat of 200 degrees or more, would seem to be an extremely difficult undertaking, requiring a lot of apparatus and a lot of men. But by the ingenious use of a five-ton truck the road commissioners of Los Angeles county accomplish it with one man and one piece of mechanism.

The truck is fitted with a 1,000 gallon oil tank, and this tank is covered with a coating of asbestos two inches thick to retain the heat. Oil is run into the tank 350 degrees Fahrenheit. Owing to the asbestos protection and the speed the truck can make, it is possible to make a trip of 35 to 40 miles before the oil gets too cold for use.

Air pressure of 60 pounds to the square inch is maintained inside the tank by an air-compressor operated by the same mechanism used to actuate a dumping body for sand and gravel.

Heat from the motor exhaust is used to keep the oil-spreader warm, so that the stuff will not thicken and clog up there. The truck travels fifty miles a day, and the driver says that in 2,000 miles only two involuntary stops were necessary on the road—both caused by dirty gasoline stopping up the fuel line.

The largest crane in the world has just been placed into operation in a Hamburg shipyard. This crane is capable of lifting and distributing 250 tons of material over an area of 182,920 feet. It was the city of Hamburg which, in the year 1888, possessed the largest crane in the world at that time, and now it is again the Hamburg shipyard of Messrs. Blohm and Voss which is able to call the largest crane in the world its own. The development of crane building during the past twenty-five years has been enormous. Germany has taken the lead in the construction of high-capacity cranes, and has delivered the majority of the 140 giant cranes which are in existence. The Deutsche Maschinenfabrik A. G. Duisburg are the constructors of this latest giant. Only two men are required for working the crane. The driver works in a cabin arranged under the load arm of the jib. In order that the crane can be worked safely after darkness a searchlight is fitted near the driver's cabin, by means of which the load is brilliantly illuminated.

The record of trade disputes maintained by the Department of Labor shows that, as is usual at this season, the majority of the disputes occurred pending the adjustment of new wage schedules. These were nearly all of short duration. The mining industry on Vancouver Island was seriously interfered with, more than 3,000 men being out during the whole month through the continuance of the dispute at Ladysmith and the Cumberland mines, and the closing down of the mines in the Nanaimo district. A great number of the disputes of the month occurred among workers in the metal trades. The disputes of May affected upwards of 11,500 employees and accounted for the loss of more than 150,000 working days. Disputes affecting the various classes of municipal employees in Vancouver and affecting also the boot and shoe workers in a number of factories in Quebec were satisfactorily adjusted during the month through the instrumentality of boards under the Industrial Disputes Investigation Act. The Department of Labor also assisted in the adjustment of disputes affecting the employees of the Hydro-Electric Commission in Toronto, and affecting also the longshoremen in Montreal and St. John, N.B. In the latter case a board has been established under the Industrial Disputes Investigation Act.